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Research Paper

Smart agriculture system using Internet of Things (IOT)

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Abstract**—***Farming has long been the most important occupation on the planet. Nonetheless, the migration of people from rural to urban areas has hampered agriculture. To address this issue, we will employ smart horticulture strategies in light of IOT . This project incorporates GPS-based remote observing, dampness and temperature detection, interloper scaring, security, leaf wetness, and legal water system administrations. It makes use of remote sensor organisations to continuously monitor soil properties and natural factors. Various sensor hubs are distributed throughout the homestead in various locations. These constraints are imposed by any remote gadget or organisation access, and the tasks are completed by connecting sensors, Wi-Fi, and a camera to a microcontroller. This concept is packaged as a product and distributed to Farmers can use that remote regulator to monitor the results of the field and grow their harvests as well. These clever agribusiness methods help ranchers finish their work efficiently and increase their yields. IoT sensors can provide information about horticulture fields. The goal of this project is to use developing technology.*

Keywords**—** *Sensors, GPS, microcontrollers, and network*

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I. INTRODUCTION

Given the global trend toward new developments and their implementation, the goal of promoting agribusiness is fundamental. Different assessments are led in the cultivation field. Most activities make use of remote sensor associations to receive data from different sensors located in various locations and send that through remote display. And the accumulated data provides information about the various regular factors. The best way to increase crop yield isn't simply testing standard components. Various factors also contribute to ineffectiveness [1]. As a result, agribusiness should embrace robotization to address these issues. To address these issues, an organised structure is required that addresses all the factors influencing productivity at each stage. Regardless, due to various issues, complete motorization in agriculture is not yet possible. It is not given to ranchers as a thing to profit from the assets, whether it is performed at the evaluation level or not. As a result, this paper is concerned with developing smart agribusinesses that use IOT and make it available to ranchers. In general, the cost of all creating blueprints with IOT- based clever development is extremely reasonable. Examiners were made aware of a couple of consolidated cutting-edge innovations that will aid in productivity development.[2]. As a result, various new advancements can be combined with traditional cultivating to achieve the goal indefinitely. The Internet of Things (IOT) can effectively develop. agriculture by using various sensors

and depictions in green nature. Considering population growth, interest in food grains has recently grown significantly . Sadly, the food grain is linked to population growth. To overcome these challenges, food production should be expanded broadly at the earliest opportunity. IOT is the best option for every farmer to get their yields created in a flexible manner with advancement [3].

II.SURVEY

Manual limit checking is a current and potentially wellestablished procedure in agriculture. Farmers use this system to confirm general limits and register readings. It focuses on developing gadgets and instruments that take advantage of the advantages of a remote sensor network structure to manage, show, and prepare clients. It intends to Make farming more efficient by incorporating mechanisation and IoT advancements. The main components include a smart GPS remote controlled robot that performs tasks such as weeding, showering, dampness recognising, human region, and watchfulness. Conveyed enlisting contraptions that can fabricate an entire figuring structure from sensors to devices that distinguish information from country field pictures and human entertainers on the ground and unambiguously feed the information into vaults close to the area as GPS arranges.This concept proposes a distinct splendid growing perspective that employs distant correspondence improvement to connect a splendid recognising framework and a sharp irrigator structure. It proposes low-cost, high-yield remote sensor network strategies for gathering soil stickiness and temperature from various farm areas and allowing crop regulators to decide whether to carry out the water structure based on the circumstances. It suggests a method for cultivating a motorised water framework system to expand water use for rural harvests An IoT-based sensing system is being developed to isolate yield climate, as well as a method to cultivate strong feasibility by inspecting harvest gauges. In this paper, image dealing with is used as a tool to survey for illnesses on common things during development, from domain to variety.

III.PROPOSED WORK

Various sensors, like temperature sensors, dampness sensors, and PIR sensors, are conveyed in the field piece. The data collected by these sensors is transmitted to the microcontroller via RS232 [4].

The obtained data is compared to the edge values in the control section. If the data exceeds the cut-off, the ringer sounds and the Drove begins to flicker. This Following identification, an advance notice message is sent to the farmer, and the power is turned off. The characteristics are created on the site page, and the farmer receives a clear representation of the characteristics [5].

In manual mode, the client must turn the microcontroller on and off by squeezing the button in the created Android app. This is done with the help of the GSM Module [6].

In customised mode, the microcontroller is turned on and off as needed if the value exceeds the cut-off point. When the microcontroller is powered on, an alert should be sent to the client. This is accomplished by using the GSM module to establish a connection with the client [7].

Furthermore, there are a few other limits such as temperature, dampness, dampness, and pir sensor shows limit worth and water level sensor is used to demonstrate the amount of water present inside the asset.

IV.HARDWARE USED

There are some hardware components that were crucial in building this project. The hardware's are mentioned in the following.

A.Microcontroller

The PIC microcontroller 16F877A is one of the most widely used in the industry. It is very reasonable and very easy to use. The controller is coding, or writing computer programmes, is also simple. The coded programme can be effectively deleted thanks to streak memory innovation. The microcontroller has numerous applications in various massive ventures. Security, remote sensors, home automation, and current robotization are some of its applications. An EEPROM is likewise included, which is utilised to forever store information, for example, transmitter codes, get frequencies, and other related data.

B.GMS Module

GSM Modems can accept SIM cards from any GSM network administrator and have the same capabilities as cell phones, each with its own unique phone number. The requirement is that it can be used as the RS-232 protocol , which is connected supportively to the regulator. It is mostly used in mobiles for sending, and receiving SMS and making phone calls. RS-232 connects the GSM modem to the regulator. AT Orders are used

to send the SMS from the number to the terminal. To control the GSM, the regulator employs "AT-Consideration" orders. It also has driven alarms and switch voltage security. It operates on 900/1800 MHz frequency band.

C.Soil Moisture Sensor

The dampness content of the dirt is determined by a dirt dampness sensor. The sensor can produce both simple and computerised results. The edge of the advanced result is fixed, but the edge of the simple result is flexible. It operates in accordance with the open and short out standards. The

Drove shows whether the outcome is high or low. When the dirt becomes dry, current cannot pass through it, resulting in an open circuit. As a result, the outcome should be the best. When the dirt becomes wet, current flows from one terminal to the next, shortening the circuit and producing a zero result. To increase productivity, the sensor is covered in platinum.
The detection range is also quite large.

D.Temparature Sensor

The LM35 sensor is basically used because the output voltage is direct with temperature scaling in Celsius. It does not support external organisation. It performs a wide range of utilitarian tasks. The most notable output voltage is 5V. For each level of temperature increase, the result will increase by 10mV. The temperature ranges from -55 to +150 degrees. VCC, Ground, and the essential sensor are the three terminals. It employs the least amount of force. As a result, it uses less energy. It is extremely useful in horticulture as well.

E.PIR sensor

All things with a temperature higher than absolute zero emit heat energy as radiation. It is hazy to the naked eye because it communicates at infrared frequencies. PIR sensors are inoperable. They do not detect or detect heat, but rather infrared radiation transmitted or reflected by an object. It is used to track the growth of people, animals, and other objects. They are as frequently as possible used in punk alerts and, thus, approved lighting frameworks. When a human walks through the field, the temperature rises above room temperature. The sensor converts the subsequent change into an adjustment of the result voltage, which initiates the acknowledgment.

V.SOFTWARE USED

Proteus 8 is an excellent proliferation programme for various microcontroller circuit plans. It is an excellent testing framework because it has almost all microcontrollers and electronic components readily available. It is commonly used to test electronic tasks and introduced plans prior to true equipment testing. Proteus can also simulate microcontroller programming. Re-authorization eliminates the risk of causing equipment damage as a result of a poor arrangement.

VI.EXPERIMENTS AND RESULTS

The equipment communicates with every sensor on the board. The microcontroller, ringer, hand-off, ADC converter, GSM module, and all sensors that work together are all part of the hardware. The board contains a sim card that is used to be in contact with owner as well as the listed qualities. accompanying outcome shows the temperature, soil suddenness condition, and interloper distinguishing proof. The following result is the result of the Android Application created in the wireless. It calculates temperature, humidity, and suddenness and detects gate crashers.

VII.FUTUREWORK AND CONCLUSION

For the future this system can be developed to cultivate large number of acres. And also it can be developed to check the soil quality and growth of the crop. we can also use wireless connection to the various nodes. All experiments and results have proven that this system is very useful in solving various irrigation problems.by implementing this system we can in the farms can help to improve the overall production.[8]

REFERENCES

[1]. Gondchawar, N. and Kawitkar, R.S., 2016. IoT based smart agriculture. International Journal of advanced research in Computer and Communication Engineering, 5(6), pp.838-842.
[2]. Mekala, M. S., & Viswanathan, P. (2017, August). A Survey: Smart agriculture IoT with cloud computing. In 2017 international conference on microelectronic devices, circuits and systems (ICMDCS) (pp. 1-7). IEEE.
[3]. Patil, K. A., & Kale, N. R. (2016, December). A model for smart agriculture using IoT. In 2016 international conference on global trends in signal processing, information computing and communication (ICGTSPICC) (pp. 543-545). IEEE.
[4]. Prathibha, S. R., Hongal, A., & Jyothi, M. P. (2017, March). IoT based monitoring system in smart agriculture. In 2017 international conference on recent advances in electronics and communication technology (ICRAECT) (pp. 81-84). IEEE.
[5]. Suma, V. (2021). Internet-of-Things (IoT) based Smart Agriculture in India-An Overview. Journal of ISMAC, 3(01), 1-15.

[6]. Suma, N., Samson, S. R., Saranya, S., Shanmugapriya, G., & Subhashri, R. (2017). IOT based smart agriculture monitoring system. International Journal on Recent and Innovation Trends in computing and communication, 5(2), 177-181.
[7]. Kassim, M. R. M. (2020, November). Iot applications in smart agriculture: Issues and challenges. In 2020 IEEE conference on open systems (ICOS) (pp. 19-24). IEEE.
[8]. Vaibhavraj S. Roham, Ganesh Pawar, Abhijit Patil & Prasad Rupnar, Smart Farm using Wireless Sensor Network, International