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Document Information

Analyzed document	Report.docx (D105339270)
Submitted	5/18/2021 10:43:00 AM
Submitted by	sagar kolekar
Submitter email	sagarkolekar5@gmail.com
Similarity	14%
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W	URL: https://interovic.es/go19kz/iot-in-agriculture-examples-3fbd0d Fetched: 2/16/2021 6:13:00 AM	1
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W	URL: https://en.wikipedia.org/wiki/ThingSpeak Fetched: 5/18/2021 10:45:00 AM	1
W	URL: https://findanyanswer.com/how-do-i-add-thingspeak-library-to-arduino Fetched: 5/18/2021 10:45:00 AM	1

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Entire Document

A Project report

On

Application of Digitally enabled Smart Farming Practices to Green house initiatives.

Submitted By Name of students (Roll No.)

1. Anuj C.S (18BCS009) 2. Arun S.M (18BCS013) 3. Darshan R.P (18BCS023) 4. Jagadeesh .C (18BCS033)

Under the guidance of Uma .S

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY DHARWAD 1. INTRODUCTION. Aim: The main objective of this project is to give the user(farmer) ability to access temperature and humidity of their nursery from anywhere

Agriculture is the broadest economic sector and plays an important role in the overall economic development of

a nation. Technological advancements in the area of agriculture will ascertain to increase the competence of farming activities. In this paper, we have proposed a novel methodology for smart farming by linking a smart sensing system through wireless communication technology. Our system focuses on the measurement of physical parameters such as Temperature and Humidity of the Greenhouse that plays a vital role in farming activities.

100%	MATCHING BLOCK 1/8	W	https://www.researchgate.net/publication/32324 ...

The main idea of this paper is focused on the review of the improvement in the Smart Farming sector. 1.1

Problem statement. Greenhouse, an urban farming approach, provides farmers with an option to provide optimum cultivation condition by offering a controlled environment according to the plants requirements. Many growers fail to get benefits and desired yield from greenhouse crops because they cannot efficiently monitor and control important factors like Humidity, temperature etc. , that determine plant growth and productivity.

1.2 SOME MAJOR PROBLEMS FACED BY TRADITIONAL FARMING: 1. Temperature going higher or below than a certain degree. 2. High humidity – resulting in crop transpiration.

2.Overview.

At present there are few companies investing in the Agricultural sector, the companies are as follow

1.

100%	MATCHING BLOCK 2/8	W	https://www.disruptordaily.com/top-10-iot-comp ...

Hortau is a wireless soil and irrigation management platform. Hortau integrates with ST field monitors which can connect to irrigation infrastructure to perform tasks such as starting pumps on-demand, based on a schedule, or based on soil conditions. 2.

100%	MATCHING BLOCK 4/8	W	https://interovic.es/go19kz/iot-in-agriculture ...

Pycno offers wireless, modular soil sensors for use in determining what the soil needs so that farmers can use only the fertilizer and other additives they need in order to reduce waste. 3.

100%	MATCHING BLOCK 5/8	W	https://www.disruptordaily.com/top-10-iot-comp ...

The Yield focuses on ensuring that the growing conditions on a farm are kept to a certain standard. The Yield offers a free app that helps users remain aware of the weather conditions. 4.

Things used In this project: 1. Dht11 – sensor which is used to collect temperature and humidity data 2. Arduino Uno - microcontroller board based on the ATmega328P 3. Esp8266 – WIFI module 4. Android studio – software used to develop/create android application 5. Firebase – to store user login information 6. Thingspeak – server to store the values provided by the sensors

3.Working of Project.

• First, dht11 sensor will read the temperature and humidity data • The data collected by the sensor sent to thingspeak server using Arduino and esp8266 • From thing speak the data will be retrieved by the android app • User will be notified by notification, if the temperature exceeds the limits.

4.

ThingSpeak Cloud.

ThingSpeak is one of the

IoT analytics platform service

that

to

ThingSpeak.

through LAN https://thingspeak.com/pages/learn_more

1.2 Working of Thingspeak.

In order to use thinkspeak cloud we are required to create an account, channel and channel fields •

Channel – channel is used to

send our data to store. • Channel field –

HOME PAGE

• Home page will show you the real time values of fields that been created • If not showing go to add visualization or add widgets to add visualizer or numeric display, lamp indicator gauge. API KEYS.

• Go to api keys section • API section has channel id, write api key, read api keys. • These keys are used to modify any field values • Write api – to write value to a field • Read api – to read value from a field • These keys are later used to create an account in smart farming android app 5.ANDROID APP • Smart farming app has been developed/created using android studio and uses firebase database to store user login information. • It retrieves data from thingspeak cloud, which contains temperature and humidity data updated by sensor. • As it retrieves data via internet, user can retrieve the data from anywhere.

SIGN UP

• User required to fill all the fields provided in the sign-up page • Name, email, password, write API key, read API key, channel id • User need to verify their email by clicking the link sent to their email • Fill the API keys obtained from thingspeak and click sign-up • All the information provided will be stored in firebase • Then it will take the user to the login page.

FIREBASE

• Firebase is a platform developed by Google for creating mobile and web applications. • Firebase gives up to 1GB Storage for free on Firestore, the latest Google realtime database. After exhausting the free storage, users will pay for storage space and database operations • User details stored in firebase.

LOGIN

• User need to Enter their email and password used while creating the account • Email need to verified in order to login • In case, If the user forgot their password, they can reset the password using “forgot option”, which sends an email to reset their password • remember option used to remember the user. • If the credentials provided are correct then the user will taken to the home page.

HOME PAGE

• Home page displays the temperature and humidity values • App will start reading the temperature and humidity data continuously from thingspeak field1 and 2, once the user clicks start button • And the app will stop when the user clicks stop button • Set temperature limits and update api keys buttons will take the user to their respective pages • User can logout using the logout button present in menu at upper right corner in the home page

NOTIFICATIONS.

• User will be notified by notification if the temperature limit goes below minimum temperature limit or beyond maximum temperature limit.

TEMPERATURE LIMITS

• User can set the maximum and minimum temperature limit by clicking “set temperature limits” button in home page which takes user to the page shown in the image • Minimum and maximum limit is updated in thingspeak field3 and 4.

API keys.

• User can also update the API keys by clicking “update API keys” button in home page which takes user to the page shown in the image • Here user can update the channel id, write API key, read API key.

CIRCUIT DIAGRAM . (online simulator)

Online simulator: Tinkercad

• Esp8266 works on 3.3v, 5v will burn the module.

6.CONCLUSION.

An automated control system of a Smart Greenhouse uses a network of sensors to monitor. Our Smart Greenhouse solution will enable farmers to monitor their parameters that are crucial for getting bumper yield, and send notification on their device.

ADVANTAGES:

1. Control environment for better yield.

2. Save power, electricity and water consumption.

We are mainly focusing on three parameters, those are as follows.

1. Temperature within the house.

2. Humidity within the house.

An automated control system of a Smart Greenhouse uses a network of sensors to monitor and measure the parameter. The gathered data is used to measure energy consumption which in turn helps farmers to use the resources optimally.

Our Smart Greenhouse solution will enable farmer to monitor their parameters that are crucial for healthy growth of the plants, send alerts when there's a problem. This will further help them with the following strategic benefits enhancing their horticultural practices:

1. Monitoring parameters for anomaly.

2. Control environment for better yield.

3. Save Power and electricity.

7.REFERENCES

1 https://www.mouser.com/datasheet/2/758/DHT11-Technical-Data-Sheet-Translated-Version-1143054.pdf. 2. https://www.tinkercad.com/learn/circuits 3. https://www.halvorsen.blog/documents/technology/iot/thingspeak/resources/ThingSpeak.pdf

8.ACKNOWLEDGMENT.

We declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we

have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above

will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

(Signature with date)

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Hit and source - focused comparison, Side by Side

Submitted text As student entered the text in the submitted document.

Matching text As the text appears in the source.

1/8	SUBMITTED TEXT	30 WORDS	100%	MATCHING TEXT	30 WORDS

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W https://www.researchgate.net/publication/323244229_Future_of_Smart_Farming_with_Internet_of_Things

2/8	SUBMITTED TEXT	44 WORDS	100%	MATCHING TEXT	44 WORDS

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W https://www.disruptordaily.com/top-10-iot-companies-disrupting-agriculture-agtech/

4/8	SUBMITTED TEXT	38 WORDS	100%	MATCHING TEXT	38 WORDS

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W https://interovic.es/go19kz/iot-in-agriculture-examples-3fbd0d

5/8	SUBMITTED TEXT	39 WORDS	100%	MATCHING TEXT	39 WORDS

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3/8	SUBMITTED TEXT	19 WORDS	100%	MATCHING TEXT	19 WORDS

Grownetics assists with the installation of indoor crop monitoring equipment to maximize growing efficiency. Grownetics uses fog networking. 2.1

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W https://www.disruptordaily.com/top-10-iot-companies-disrupting-agriculture-agtech/

6/8	SUBMITTED TEXT	28 WORDS	100%	MATCHING TEXT	28 WORDS

allows you to aggregate, visualize and analyze live data streams in the cloud. ThingSpeak provides instant visualizations of data posted by your devices

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W https://thingspeak.com/pages/commercial_learn_more

7/8	SUBMITTED TEXT	70 WORDS	93%	MATCHING TEXT	70 WORDS

According to its developers, “ThingSpeak is open-source IoT application and API to store and retrieve data from things using the HTTP and MQTT protocol over the Internet or

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W https://en.wikipedia.org/wiki/ThingSpeak

8/8	SUBMITTED TEXT	53 WORDS	92%	MATCHING TEXT	53 WORDS

Each channel includes 8 fields for any type of data. Once you have a ThingSpeak Channel you publish data to the channel, have ThingSpeak process the data, then have your application retrieve the data.

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W https://findanyanswer.com/how-do-i-add-thingspeak-library-to-arduino