LITERATURE SURVEY ON “Smartfarmer - Iot Enabled Smart Farming Application”

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INTRODUCTION		SURVEY/BODY OF REVIEW			CRITICAL ANALYSIS ON PAPER	
YEAR	**TITLE**	**PROBLEM**	**METHODOLOGY**	**INPUT PARAMETRES**	**RESULTS**	**FUTURE SCOPE**
January 2021 IEEE Xplore Part Number: CFP21F70-ART; ISBN: 978-1-7281-8501-9	***IoT based Automated Indoor Agriculture System Using Node-RED and IBM Bluemix.[1]***	The author compared indoor as well as outdoor farming and observed that the indoor farming was most sustainable option for agriculture. Thus, the project's goal was to automate the indoor agriculture process.	**Tools used**:IBM IoT sensors and NodeRED, flutter framework,IBM bluemix,MQTT protocol. **Implementation** This project was carried out as follows: Interfacing IBM Bluemix with Node-RED→ Obtaining sensor data on Node-RED through MQTT and IBM IoT→ Automating the processes using Node-RED →Integration with Mobile Application.	The parameters that were considered are weather conditions, intensity of light, and soil conditions	**Advantages:** 1)The method proposed by the author was more efficient than conventional IoT monitoring systems as it not only monitors the values and keeps the farm owner updated but also it automates essential parameters leading to healthy plant growth, were possible. **Disadvantages:** 1)High cost for installation of the set-up and high operational costs.	• This project could be further improved by incorporating more sensors, drones and for various activities. • The future work can be aimed at forcasting the climatic condition in that region and automate the farming process according to that value.

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2017 IEEE international conference on technological innovations in ICT for agriculture and rural development	***IoT based Smart Soil Monitoring System for Agricultural Production. [2]***	The purpose of this project is to provide embedded based system for soil monitoring and irrigation to reduce the manual monitoring of the field and get the information via mobile application.	**Tools used:** Microcontroller:MCP3008 Communication technologies: wi-fi, socket communication, SPI Sensors: pH sensor, temperature sensor, humidity sensor **Implementation**: The analog sensed value are converted to digital using MCP3008.Using socket communication the datas are sent and the required actions are taken.The relevant crop is suggested to farmer using mobile app.	Soil pH, Soil humidity, temperature, crop image	**Advantages**: 1)This system reduces the farmer difficulty in finding the right crop for the field. 2)It provides the farmer to cultivate suitable crop by analysing sensor value. 3)It increases agriculture production and reduces the time and money of the farmer. **DISADVANTAGE:** 1)Efficient only for short distance communication.	This project could be further extended by employing Raspberry Pi 2 Model B as processor which posses 8 times the processing memory of previous model. This could be further developed by employing weather forecasting techniques.

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2017 Journal of Engineering and Applied Science	Design and Implementation of modern automated real time monitoring system for agriculture using IoT. [3]	The main aim of this project is to overcome certain issues like surplus watering or less watering of plants which affects the production	**<u>Tools used:</u>** ZigBee,ARM7,temperature sensor,humidity sensor,relay driver,solenoidal valve. **IMPLEMENTATION:** Node is initialize→sensors are initialized→rensor values read→sent to server using IoT→if moisture low→motor On	Moisture level of the soil,humidity level,temperature level	**Advantages:** It was a good solution for irrigation problem **Disadvantages:** Storage of data was not given importance The type of the soils were not considered The weather conditions were neglected in the process	Crop protection could be added with this project to protect the crops from animals. Cloud computing could be used to store and retrieve data

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2018 by IEEE	Automated Irrigation System-IoT Based Approach.[4]	The purpose of this project was to ensures that crop has been provided optimum amount of water without any manual labour or wastage.	**TOOLS USED:** Microcontroller: Arduino Cloud server: Web server Communication Technologies: Wi-Fi Module Sensors: Moisture Sensor **Implementation:**Soil moisture sensors are connected with Arduino kit to get value of moisture of soil of farm. Then these gathered values are compared with threshold values and pump is operated .	Soil moisture	**Advantages:** Reduced the wastage of water and labor Threshold value is set to control the water supplement **Disadvantages:** Data transfer resolution is not mentioned No data regarding the weather conditions were created	This project could be further extended by employing other sensors like temperature sensor and improve the accuracy of monitoring the plants. This could be further developed by employing weather forecasting techniques.

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Journal of ISMAC (2021) Vol.03/ No.01	Internet of Things (IOT) based Smart Agriculture in India.[5]	This study deals with demand, for food grain increases abruptly to overcome this with all farming solutions with IOT based smart agriculture.	**COMPONENTS USED:** Units of culture analysis, predictive analysis, IOT clouds, IOT devices and sensor module, Agri-robot, and security management for all integrating devices zig bee protocol, Arduino UNO along with raspberry pie. **Implementation:** The images of the crop were captured and culture and predictive analysis were applied and the result was provided	Crop Images	**Advantages:** • Cost effectiveness. • The predictive analysis will be useful to face the challenges. • Better accuracy. • Increase the production **Disadvantages:** • Few limitations are also incorporated constrained model for platforms and security. • Heterogeneity property is a very complicated process	• In future, we may include additional features for monitoring agricultural fields like humidity, temperature, soil sensor, water level, wind direction in the field, climate such helps to predict the challenges. • Including IoT to encourage more e-farming.

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NOVEMBER 4-7,2019 Coimbra, Portugal	Smart Farming using IoT, a solution for optimally monitoring farming conditions.[6].	IoT technology to increase the productivity in agriculture.	**COMPONENTS USED:** ESP32s Node MCU,Breadboard,DHT11 Temperature and humidity Sensor,Soil Moisture Sensor,S11145 Sensor for UV/IR and visible light index,LEDs,KY-006 passive buzzer,Power Supply-Power Bank **Implementation:** The sensor used here takes the readings and upload those on the blynk app cloud to feed the live data. The LEDs retain the state to different colours when the farmer didn't hear the sound or see the notification in their mobile	Soil moisture, temperature,humidity,UV/IR and visible light index	**Advantages:** • ADVANTAGES: • Remote monitoring for farmers,water and other natural conservation. • good management with improved livestock farming. • good and improved quality. • things that cant be seen through naked eye can be seen with accurate farmland and crop evalution **Disadvantages:** • Agriculture being natural phenomenon relies mostly on nature • need of continuous internet connection	• The project could be extended by installing multiple prototypes • This could be improved by employing cloud to retrieve data. • Data mining algorithm could be applied to improve accuracy • These systems could be connected to drones to provide 3D mapping of farming lands

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