|  |
| --- |
| LITERATURE SURVEY ON “Smartfarmer - Iot Enabled  Smart Farming Application”  TEAM ID: PNT2022TMID40641    TEAM LEADER: POOVARASAN.P  TEAM MEMBERS:  1) POOVARASAN.V  2) VIGNESH.M  3) PRAVEENKUMAR.M  4) SREE CHANDRU.G |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **INTRODUCTION** | | **SURVEY/BODY** **OF** **REVIEW** | | | **C** **RITICAL** **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**  T his 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. | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **INTRODUCTION** | | **SURVEY/BODY** **OF** **REVIEW** | | | **C** **RITICAL** **ANALYSIS** **ON** **PAPER** | | | **YEAR** | **TITLE** | **PROBLEM** | **METHODOLOGY** | **INPUT**  **PARAMETRES** | **RESULTS** | **FUTURE** **SCOPE** | | 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**: T he  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. | |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | |
|  | **INTRODUCTION** | | **SURVEY/BODY** **OF** **REVIEW** | | | **C** **RITICAL** **ANALYSIS** **ON** **PAPER** | |  |
| **YEAR** | **TITLE** | **PROBLEM** | **METHODOLOGY** | **INPUT** **PARAMETRES** | **RESULTS** | **FUTURE** **SCOPE** | |
| 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 | **Tools** **used:**  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 | |
|  | | | | | | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **INTRODUCTION** | | **SURVEY/BODY** **OF** **REVIEW** | | | **C** **RITICAL** **ANALYSIS** **ON** **PAPER** | | | **YEAR** | **TITLE** | **PROBLEM** | **METHODOLOGY** | **INPUT** **PARAMETRES** | **RESULTS** | **FUTURE** **SCOPE** | | 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  Thresho ld 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. | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **INTRODUCTION** | | **SURVEY/BODY** **OF** **REVIEW** | | | **C** **RITICAL** **ANALYSIS** **ON** **PAPER** | | | **YEAR** | **TITLE** | **PROBLEM** | **METHODOLOGY** | **INPUT** **PARAMETRES** | **RESULTS** | **FUTURE** **SCOPE** | | 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. | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | **INTRODUCTION** | | **SURVEY/BODY** **OF** **REVIEW** | | | **C** **RITICAL** **ANALYSIS** **ON** **PAPER** | | | **YEAR** | **TITLE** | **PROBLEM** | **METHODOLOGY** | **INPUT** **PARAMETRES** | **RESULTS** | **FUTURE** **SCOPE** | | 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 | |

|  |
| --- |
| **References:**  1) V. David, H. Ragu, R. K. Duraiswamy and S. P, "IoT based Automated Indoor Agriculture System Using Node-RED and IBM Bluemix," 2021 6th International Conference on Inventive Computation Technologies (ICICT), 2021, pp. 157-162, doi: 10.1109/ICICT50816.2021.9358672.  2) Ananthi N., Divya J., Divya, M., and Janani, V. (2017). IoT based smart soil monitoring system for agricultural production. IEEE Technological Innovations in ICT for Agriculture and Rural Development (TIAR). doi: 10.1109/tiar.2017.8273717  3) Na lajala, P. Kumar, D.H. Ramesh, P. & Godavarthi, B. 2017. Design and implementation of modern automated real time monitoring system for agriculture using internet of things (IoT). J. Eng. Appl. Sci, 12.  4) Mishra D., Khan A., Tiwari R., and Upadhay S. (2018). "Automated Irrigation System-IoT Based Approach". 3rd International Conference on Internet of Things: Smart Innovation and Usages (IoT-SIU).  5) V, Suma. (2021). Internet-of-Things (IoT) based Smart Agriculture in India - An Overview. Journal of ISMAC. 3. 1-15. 10.36548/jismac.2021.1.001.  6) Jash Doshi, Tirthkumar Patel, Santosh kumar Bharti,Smart Farming using IoT, a solution for optimally monitoring farming conditions, Procedia Computer Science,Volume 160,2019. |