LITERATURE SURVEY

1)**PAPER TITLE:** Smart Farming – IoT in Agriculture

AUTHORS: Rahul Dagar, Subhranil Som, Sunil Kumar Khatri Amity Institute of Information Technology, Amit University Uttar Pradesh, Noida, India.

ABSTRACT:

IoT is a revolutionary technology that represents the future of communication & computing. These days IoT is used in every field like smart homes, smart traffic control smart cities etc. The area of implementation of IoT is vast and can be implemented in every field. This paper is about the implementation of IoT in Agriculture. IoT helps in better crop management, better resource management, cost efficient agriculture, improved quality and quantity, crop monitoring and field monitoring etc. can be done. The IoT sensors used in proposed model are air temperature sensor, soil pH sensor, soil moisture sensor, humidity sensor, water volume sensor etc. In this paper I surveyed typical agriculture methods used by farmers these days and what are the problems they face, I visited poly houses for further more information about new technologies in farming. The proposed model is a simple architecture of IoT sensors that collect information and send it over the Wi-Fi network to the server, there server can take actions depending on the information.

DISADVANTAGES:

- Absence of interoperability: Common building pieces, information conventions,and benchmarks are require for billions of gadgets to interoperate, and they are different fitting guidelines in the agrifood space trying to achieve a general accord here. Such gauges exist for semantics and information displaying (e.g., AgroRDF,AgroVOC, agroXML), agri - hardware (e.g., ISO-BUS), climate information (e.g., SWEET), for the sup-handle chain (EPCIS from GS1), online business retail locations (e.g., Good Relations and Schema.org).

2)**PAPER TITLE:** Providing Smart Agricultural Solutions to Farmers for better yielding using IoT

AUTHORS: M.K.Gayatri Student,Computer ScienceandEngineering,Easwari engg college Chennai,India.J.Jayasakthi Student,Computer science and Engineering Easwari engg college Chennai,India , Dr.G.S.Anandha Mala Professor and Head,Computer science and Engineering Easwari engg college Chennai,India.

ABSTRACT:

The field of Cloud computing is helping in leaps and bounds to improvise our ageold business - Agriculture. Practical applications can be built from the economic consumption of cloud computing devices that can create a whole computing ecosystem, from sensors to tools that observe data from agricultural field images and from human actors on the ground and accurately feed the data into repositories along with their location as GPS co-ordinates. In reality, sensors are now able to detect the position of water sources in a subject that is being investigated. Issues related to farmers are always hampering the course of our evolution. One of the answer to these types of problems is to help the farmers using modernization techniques. This paper proposes an approach combining the advantages of the major characteristics of emerging technologies such as Internet of Things (IoT) and Web Services inorder to construct an efficient approach to handle the enormous data involved in agrarian output.The approach uses the combination of IoT and cloud computing that promotes the fast development of agricultural modernization and helps to realize smart solution for agriculture and efficiently solve the issues related to farmers.

DISADVANTAGES:

- Disrupted Connectivity to the Cloud.

3)**PAPER TITLE**: A Low Power IoT Network for Smart Agriculture

AUTHORS: Soumil Heble, Ajay Kumar, K.V.V Durga Prasad, Soumya Samirana, P.Rajalakshmi, U. B. Desai Department of Electrical Engineering Indian Institute of Technology - Hyderabad, India.

ABSTRACT:

Traditional agriculture is transforming into smart agriculture due to the prominence of the Internet of Things (IoT). Low-cost and low-power are the key factors to make any IoT network useful and acceptable to the farmers. In this paper, we have proposed a low-power, low-cost IoT network for smart agriculture. For monitoring the soil moisture content, we have used an in-house developed sensor. In the proposed network, the IITH mote is used as a sink and sensor node which provides low-power communication. We have evaluated our network with state of the art networks, proposed for agriculture monitoring. Power and cost are the two metrics used for evaluation of these networks. Results show that the proposed network consumes less power and has on average 83% prolonged lifetime at a lower cost compared to previously proposed network in the agriculture field.

DISADVANTAGES:

- High Hardware Costs.
- The smart farming based equipments require farmers to understand and learn the use of technology. This is major challange in adopting smart agriculture farming at large scale across the countries.

4) **PAPER TITLE:** Smart Farming System using IoT for Efficient Crop Growth

AUTHORS:

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ABSTRACT:

Smart agriculture is a farming system which uses IoT technology. This emerging system increases the quantity and quality of agricultural products. IoT devices provide information about nature of farming fields and then take action depending on the farmer input. In this paper, an IoT based advanced solution for monitoring the soil conditions and atmosphere for efficient crop growth is presented. The developed system is capable of monitoring temperature, humidity, soil moisture level using Node MCU and several sensors connected to it. Also, a notification in the form of SMS will be sent to farmer's phone using Wi-Fi about environmental condition of the field.

DISADVANTAGE:

- One huge disadvantage of smart farming is that it requires an unlimited or continuous internet connection to be successful.

5)**PAPER TITLE:** Classification and Yield Prediction in Smart Agriculture System Using IoT

AUTHORS: Ms. Akanksha Gupta,Department of computer science, University of Delhi.

Dr. Priyank Nahar, Shri Venkateshwara University, Gajraula, India.

ABSTRACT:

The Modern agriculture industry is datacentred, precise and smarter than ever. Advanced development of Internet-ofThings (IoT) based systems redesigned "smart agriculture". This emergence in innovative farming systems is gradually enhancing the crop yield, reduces irrigation wastages and making it more profitable. Machine learning (ML) methods achieve the requirement of scaling the learning performance of the model. This paper introduces a hybrid ML model with IoT for yield prediction. This work involves three phases :preprocessing, feature selection(FS) and classification. Initially, the dataset is preprocessed and FS is done on the basis of Correlation based FS (CBFS) and the Variance Inflation Factor algorithm (VIF). Finally, a two-tier ML model is proposed for IoT based smart agriculture system. In the first tier, the Adaptive k-Nearest Centroid Neighbour Classifier (aKNCN) model is proposed to estimate the soil quality and classify the soil samples into different classes based on the input soil properties. In the second tier, the crop yield is predicted using the Extreme Learning Machine algorithm (ELM). In the optimized strategy, the weights are updated using modified Butterfly Optimization algorithm (mBOA) to improve the performance accuracy of ELM with minimum error values. PYTHON is the implementation tool for evaluating the proposed system. Soil dataset is utilized for performance evaluation of the proposed prediction model. Various metrics are considered for the performance evaluation such as accuracy, RMSE, R2, MSE, MedAE, MAE, MSLE, MAPE and Explained Variance Score (EVS).

DISADVANTAGES:

- Less efficient
- Covers short area.

6) **PAPER TITLE:** IoT based Classification Techniques for Soil Content Analysis and Crop Yield Prediction

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ABSTRACT:

Agriculture aided by IoT is called Smart Agriculture and it gives rise to precision farming. Soil Monitoring combined with Internet of Things (IoT) technology aids in the enhancement of agriculture by increasing yield through gauging the exact soil characteristics such as Moisture, Temperature, Humidity, PH, and Nutrition content/Fertility. This data is then gathered in cloud storage and with the appropriate data operations; it enabled us to optimize farming strategies and helped create a trend analysis. This, then, allows us to precisely utilize resources and steer the farming methods in prudent ways to optimize yield. The proposed IoT system is composed of pH sensors, Humidity and temperature sensors, Soil moisture sensors, soil nutrient sensors (NPK) probes, microcontroller/microprocessor equipped with WiFi and Cloud storage. When the sensors are implemented, they measure the corresponding characteristics and transmit time-stamped live data to the cloud server. These sensors work together and provide wholesome data to the analyst. For the recommending system, the SVM and Decision Tree algorithm is proposed to get the crop suitable for the given soil data and helps to enhance the growth using an optimized farming process.

DISADVANTAGES:

The smart agriculture needs availability of internet continuously. Rural part of most of the developing countries do not fulfil this requirement. Moreover internet connection is slower.

7)**PAPER TITLE:** IOT Based Crop-Field Monitoring

AUTHORS: Rajalakshmi.P, Mrs.S.Devi Mahalakshmi.

Abstract:

Internet Of Things (IoT)is a shared network of objects or things which can interact with each other provided the internet connection. IoT plays an important role in agriculture industry which can feed 9.6 billion people on the Earth by 2050. Smart Agriculture helps to reduce wastage, effective usageof fertilizer and thereby increase the crop yield. In this work, a system isdeveloped to monitor crop-field using sensors (soil moisture, temperature, humidity, Light) and automate the irrigation system. The data from sensors are sent to web server database using wireless transmission. In server database the data are encoded in JSON format. The irrigation is automated if the moisture andtemperature of the field falls below the brink. In greenhouses light intensity control can also be automated in addition to irrigation. The notifications are sent to farmers' mobile periodically. The farmers' can able to monitor the field conditions from anywhere. This system will be more useful in areas where wateris in scarce. This system is 92% more efficient than the conventional approach.

DISADVANTAGES:

- It costs a lot of money to make or buy robots.
- They need maintenance to keep them running.
- The robots can change the culture / the emotional appeal of agriculture.

8) **PAPER TITLE:** IOT BASED SMART FARMING SYSTEM

AUTHORS: 1.Akshay Atole, 2.Apurva Asmar, 3.Amar Biradar, 4.Nikhil Kothawade, 5.Sambhaji Sarode, 6.Rajendra G. Khope,Department of Computer Engineering, M.I.T. College of Engineering, SPPU, Pune,Founder and CEO,ioCare Pune.

ABSTRACT:

Farming is a major input sector for economic development of any country. Livelihood of majority of population of the country like India depends on agriculture. In this project, it is proposed to develop a Smart Farming System that uses advantages of cutting edge technologies such as IoT, Wireless Sensor Network and Cloud computing to help farmers enhance the way farming is done. Using sensors like temperature, humidity, moisture etc. are used to get information about the field and help farmers to take precise decisions on insights and recommendations based on the collected data.

DISADVANTAGES:

- Lack of access to poor farmers.
- The high cost of research and development.

9) **PAPER TITLE:** Implementation Of Iot Based Smart Village.

AUTHORS: Gayathri Natarajan and Dr. L. Ashok Kumar.

ABSTRACT:

In this paper, IoT based smart village system is developed to support value-added services for various attributes of the village and for the people, while it still being a broad and complex category that are characterized by specific application domain. Rural developments are designed to support the Smart village mission, which aims at exploiting the most advanced communication technologies. The global focus on waste, energy and watermanagement and conservation and the cloud based system plays a key role in extending the connected benefits of the smart village beyond the distribution, automation and monitoring being done by utility. IoT based Monitoring system will help consumers to monitor their own usage and adjust behaviours. The proposed systems will eventually regulate automatically by operating during off-peak energy hours and connect to sensors to monitor occupancy, waste collection system, lighting conditions, and also optimized irrigation management for those attributes are incorporated. This paper will address and discuss the technical solutions for the energy management, smart irrigation system and waste management which can be adopted in the rural development mission.

DISADVANTAGES:

- The farmers can lose their jobs.
- Energy cost and maintenance.

10) **PAPER TITLE:** Intelligent Farming by using Arduino Technology

AUTHORS: Narayut Putjaika, Sasimanee Phusae, Anupong Chen-Im.

ABSTRACT:

"Internet of Things" (loT) is a technology that allows things tocommunicate and connect with each other. This will change the patterns and processes in both industry and agriculture towards higher efficiency. Particularly,agriculture is an important foundation of Thai economy. Consequently, wepropose an intelligent farming system (IF) to improve the production process in planting. IF composes of two main parts which are a sensor system and a controlsystem. In this paper, we focus on the control part which are watering and roofingsystems of an outdoor farm based on the statistical data sensed from the sensor systems (including temperature, humidity, moisture and light intensity sensors) Since the sensed data would not be always accurate due to noises, we apply Kalman filtering to smooth the data before using as an input in our decision making process. For the decision making process, we do not consider only the sensed data, but also the weather information. A decision tree model is generatedto predict the weather condition. Then, a set of decision rules based on both the sensed data and the predicted weather condition is developed to automatically make a decision on whether watering and roofing system should be on or off.

DISADVANTAGE:

- Lack of native connectivity limits possible Internet of Things (IoT) uses.
- Limited on board memory can make complex programs difficult.