Research paper on Vegetation Health Monitoring Using Agricultural IOT

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Abstract:- Vegetation health monitoring project aims to measure and record data about crops in real time using the reflectance of light shined or water provided on the growing plants. Sensors can be installed across the application boom to collect information while the different span of time of the plant growth. The data is logged and mapped to be used in further analysis – or for real-time variable rate applications. This kind of data is the key to precision farming. Collect information in the fields, analyze and then make decisions based on the data..A Sensor Network (SN) is a group of sensor nodes work collaboratively to perform a common task. SensorNetworks plays a major role in the development of monitoring air, soil and water, habitat monitoring, agriculturalmonitoring, military surveillance, inventory tracking etc.Sensors are used in agriculture to monitor Temperature, Humidity, Soil moisture, Wind (speed and direction), Pressure. In the existing systemarduino,and the sensors are used to track the needs of the canopy growth. External server is used to collect the data.In proposed system, a plant growth will be monitored in terms of sunlight, temperature and soil moisture, and read values will be fed into the applicationon the user's mobile phone.With this Project, plant breeders can evaluate the performance of different plant varieties using measurements taken from remote sensors. These sensors monitor things like soil moisture, atmospherictemperature, and soil moisture and are often used for crop variety trials. The system has a great advantage, that is expandable and so new type of sensors and controllers can be added without affecting the existing infrastructure; power and communication are made using a single cable This allows planning appropriate necessities for the vegetation, and monitoring the vegetation's health.

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I. INTRODUCTION

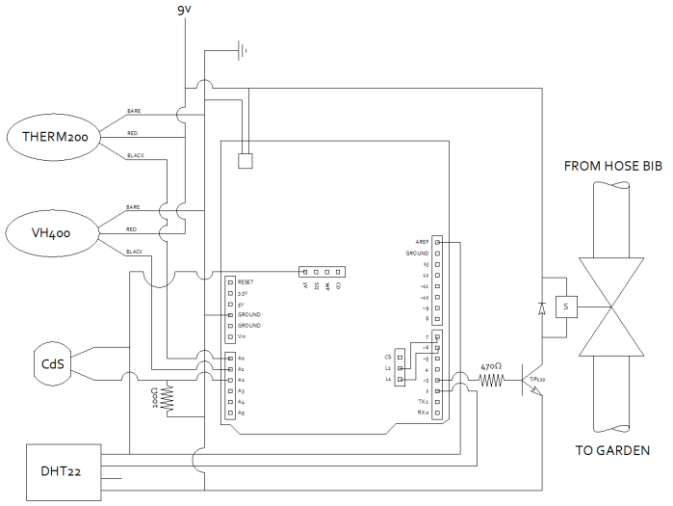
According to the development trend of modern vegetation growth and the requirements for science and technology. The traditional methods mainly rely on natural resources and low labor costs. It's difficult and inefficient, and the workload is heavy.So it cannot meet the requirements of modern vegetation growth which is high-yield, high quality, efficient, safe and ecological. Because the IOT (Internet of Things) technology was applied to agriculture, the modernization and the information technology of agriculture have been greatly improved. The paper introduces the concept of IOT and summarizes applications in the modern breeding, crop growth, quality and safety of products monitoring with using IOT.

Nowadays, with the rapid development of wireless network technology, control technology and Internet of Things, the concept of smart home has become increasingly more common. As an element of smart home, smart pot has become more popular than ever among a growing number of young people.. This project puts forward a remote smart pot based on wireless signal transmission.The productivity of plant growth is heavilyinfluenced by the change in environmental. Whenwater in the soil, solar radiation, humidity and all factors affecting the production.The crop management can be carried outby gathering the present status of these parameters of the field and user can take necessary action to improve thegrowth.

A group of sensor nodeswork collaboratively to perform a common task. Recentlysensor make revolution into many segments of oureconomy and life, from environmental monitoring, toautomation in the transportation, to manufacturing andbusiness asset management and health care industries. Inenvironmental monitoring agriculture need for increasingthe production and simultaneously the efforts forminimizing the environmental impact and for saving costsmake the sensor systems the best.Wireless Sensor Network is

widely used in electronics. The design to implement formonitoring the growth of canopy using sensor networkwhich manages information.

The use of crop sensing technology in grains, cereals and other production this is one technique to increase plant health and yield potential. Sensors measure the needs of your crop and provide application rate recommendations for their needs in real time to maximize your profit.



II. LITERATURE REVIEW

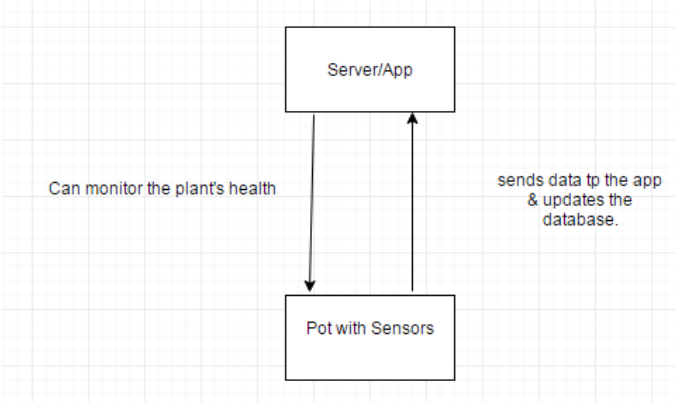
IOT remains a key to unlocking the potential for a sustainable ubicomp reality, particularly for devices. While power harvesting from natural and renewable sources has been

a longstanding research area, there is surprisingly little in the published literature that demonstrates the long-term, practical capabilities of garnering IOT from daily monitoring. Range greatly over the course of a typical day, including periods of growth, quiet intervals for reading vegetation growth, and highly active periods of sensor notation. Most prior research into this performance using subjects has been performed for short time intervals in IOT simulations of selected vegetation activities. In this work we report the first all-day, continuous all-activity study of health of the vegetation performance.

Becoming mature enough to be used for improving the quality of life, wireless sensor network technologies are considered as one of the key research areas in computer science and healthcare application industries. The pervasive vegetation systems provide rich contextual information and alerting mechanisms against odd conditions with continuous monitoring. This minimizes the need for continuous monitoring and helps the chronically develop any vegetation, besides provides quality care for those. Although having significant benefits, the area has still major challenges which are investigated in this paper. We provide several state of the art examples together with the design considerations like unobtrusiveness, scalability, energy efficiency, security and also provide a comprehensive analysis of the benefits and challenges of these systems.

III. MODIFICATION OVER EXISTING SYSTEM

Present State: There is a working model in the market which has come up. The plant is usually over flooded with water or has soaked in too much sunlight making it dry. No specific timeline is mentioned of the plants. We are not able to understand the resources which the plant needs. Plants will be given specific resources needed for its growth avoiding any harm caused by excess/less amount of resources given to the plant. Specific elements of the plant can be monitored. (Eg : Atmospheric Temperature, Soil Moisture & Sunlight). The growth of the plant can be monitored via app. Needs of the plant can sometimes be known through analysis of the data acquired. Our system can access the plant health by a simple application through the phone. Comparison of various vegetation can be developed in our project, while the plant health monitor just monitors the plants.



IV. FEASIBILITY STUDY

Technical feasibility**:** The hardware and software components needed in this project are as follows: 1) Sensors: The various sensors in collaboration are Soil moisture sensor, Temperature &humidity sensor, Sunlight sensor. 2) Connecting sensors and receiving data:The sensors will be collaborated and working in sync with the help of an Arduino, Routers and wifi.The transportation layer:The internet of things (IOT) in agriculture consisted three layers, including perceive, transportation and application. The perceive layer were used to acquire the information of crops, soil and environment. The transportation layer was used to establish the transportation network of IOT in by combing the techniques like GPRS,, WIFI, sensor detectors and the intelligent networking methods. The process layer focused on the intelligent management, including multidimensional information fusion intelligent decision and automatic control.

Data collection and Analytics:To fulfil the objectives of System, providers must decide the amount of data that is good enough for vegetation care. With strong requirement research, providers must decide the data required for their processes and also assess how the device will transmit data, either on a continuous basis or at regular intervals.

Economic feasibility:Project or product life: The aim of the product is complete monitoring of the vegetation growth. With the use of IOT and the application on the users mobile or computer, constant monitoring of a particular sapling is possible. Not only the monitoring, the application would have complete database of the ‘ideal’ requirement of the sapling, which helps the user to provide necessary measures for the appropriate care of the vegetation.Cost of the product: The various components needed for this project are the sensors, arduino kit, routers, SDK. The cost of the sensors and the arduino is quite economically feasible.

V. CONCLUSION

What this paper introduces is a remote smart pot system combining network technology, control technology and Internet of Things, which, compared with the foreign and domestic similar technologies or products, is innovative to some degrees: 1. Different from existing foreign and domestic systems or products of the same kind, it is a real remote wireless smart one with all operations completed through mobile APP. 2. The paper points out that user is required to log in mobile APP to verify identity information and the web camera can work only if it is associated with user ID, but it hasn’t proposed a more proper solutions regarding user’s personal information security, therefore, user’s personal information security may bbe violated during the transmission process, which will be the emphasis in further study.

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