Simplification of Agriculture and Farming Using IoT and AI

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Abstract— The Internet of things (IoT) is modernizing the agriculture enabling the farmers with the various techniques such as precision and sustainable agriculture to face challenges within the field. Internet of Things in Agriculture has come up as a second wave of revolution. IoT technology helps in collecting information about conditions like moisture level of the soil, level of water, pest detection in to the sector and crop growth. Precision Agriculture is one in all the foremost applications of IoT in Agriculture.
Keywords: Agriculture, Farming, IoT and AI

I. INTRODUCTION

In 1995, "thing to thing" was formulated by Bill Gates. In 1999, IoT (Internet of Things) has come up with EPC global. Internet of thing is concerned with interconnection between human to thing, thing to thing and human to human. Within The present scenario the fruit of farming isn't enjoyed by the farmers because of various reasons like insects attacks, plant disease and there are also other various obstacles. . In order to eradicate these obstacles and make farming more profitable and smart and friendly for farmers they demand technological advancement. Traditional Farming & Precision Farming are very different from one another in every way. Smart farming uses new technologies like smart connected devices, IoT sensors. Internet Farmers chatting community time to time assessment of varied factors like best conditions for plant to grow, soil quality, water quality check, etc. Smart Farming makes farming easy, economical (cost effective), minimize labor cost and improve crop yielding, and supply better production.

II. INTERNET OF THINGS (IOT)

The Internet of Things (IoT) is a system of reticulated computing devices, mechanical and digital machines, objects, animals or folks that unit of measurement give with distinctive identifiers, and thus, the ability to transfer information over a network connected the devices while not requiring the human-to-human or human-to-computer interaction. Once something is connected to the web, which offers that it'll transmit data or receive data or each. This ability to transmit and receive data make things good.

III. PROPOSED MODEL

A. *Arduino*

The arduino Uno is an open source microcontroller board was developed by arduino.cc. The board is furnished with set of digital and analog input/output. It is an open source electronics platform which supported both hardware and software interface. Arduino boards are able to read inputs and output flashes on a sensor, a finger on a button, a Twitter message and turn it into an output activating a motor, turning on an LED and used for broadcasting also.

B. *Arduino IDE*

Arduino was invented at Ivrea Interaction Design Institute as an easy and fast prototyping. The Arduino Integrated Development Environment (IDE) is an adaptive application that can be written in functions from C and C++. Arduino ide is employed for writing and uploading programs to Arduino compatible boards. It is an open-source Arduino Software which will run on any Windows, MAC OS and Linux sysytems. The source code for the IDE was developed under the GNU General Public License. The latest version of Arduino software is Arduino 1.8.12.

C. *Soil Moisture Sensor*

The soil moisture sensor is used to measure the water content of soil with the help of capacitance. The server receives the collected data, which will then check for the moisture content. It is being used in various fileds like soil science, environmental science, agricultural science and many more. If moisture level is less than the expected level then water will be supplied from the tank in order to moisturize the soil. If the moisture content is high limited level of water will be supplied than the usual supply. The sensors get the data related to crop observation and send to the server. The server can implement action such watering the plants if the soil wetness below the sting values. Such actions unit measure done by the server mechanically while not manual intervention.

D. *Ultra Sonic Sensor*

Ultrasonic sensors is used as a proximity sensors. It is a device which measures the space of a target object by sensing the sound waves and converts the reflected sound into an electrical signal. These sensors are used in robotic obstacle detection system, in medical technology and also in manufacturing technology. They work by emitting sound waves which are in higher frequency that the human could not hear. Ultrasonic sensors can even measure the fluid flows. Some sensors use a separate sound emitter and receiver, it is also possible to merge these into one.

E. *NodeMCU Module*

NodeMCU is a firmware and development kit which is used for prototype and also used for building IoT products. It is widely based on ESP8266 wifi module, which uses lightest high-level lua programming language or Arduino IDE. The interface module is partitioned into two as firmware and hardware where it first runs on ESP8266 Wi-Fi SoC and later it is based on the ESP-12 module. Since NodeMCU is open source platform, their hardware is used for modify, edit, and build.

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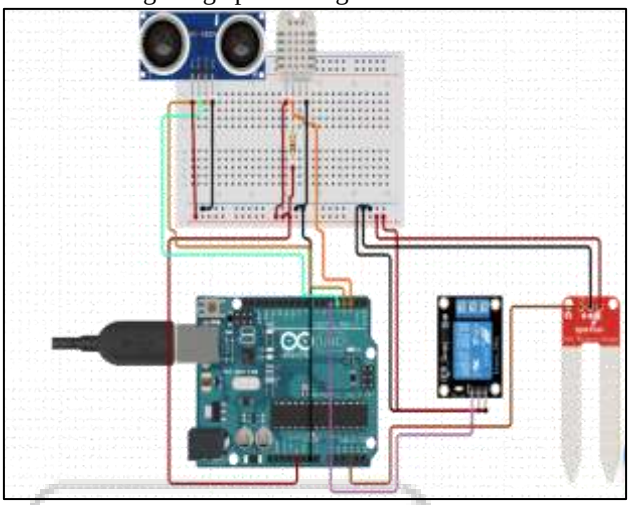
IV. PROPOSED MODEL

A. Crop Management

The sensors get the data associated with the crop information and send to the server. The server can implement action such as watering the plants if the soil wetness is below the sting values. Such actions units are done by the server mechanically while not manual intervention. The crops which are affected by diseases are identified using image processing.



V. CONCLUSION

The proposed System reduces the Human intervention in farming and gets to be basically critical to make productive procedures for farming related exercises. In the proposed work, to Automate and Simplify Farming using Emerging technologies like Internet of Things, Artificial Intelligence and Image Processing in addition with pest management, irrigation, soil monitoring etc. Accordingly, giving more precise outcomes.

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