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SMART IRRIGATION SYSTEM USING LABVIEW AND IOT

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Abstract - Now a days ,it is important to save the water for farming, the farmer can not be only depend on rain water. For the growth of plant appropriate soil water level is necessary and for that the fields should have proper irrigation level. To monitor and indicate the soil moisture level we have to design easy and simple method, this is the main objective of this paper. Using the LABview as monitoring software the optimization of resources will done and at the same time growth of plant will achieved and directly seen the sensor data on internet. For the replacement of expensive controllers the Arduino will be used in this project. To analyze signals such as moisture, rain and temperature from sensor the arduino at mega programmed. Especially in rural areas the manufacturing cost matters, So we are using easily available components, it reduces the maintenance cost also.

Keywords - IOT, LABVIEW, Rain sensor, Soil Sensor, Arduino ,Laptop**.**

I. INTRODUCTION

Agriculture irrigation is a important phenomenal in India agriculture depends on monsoon season due to insufficient source of water source of irrigation used for agricultural purpose . The irrigation system also depends on type of soil. There are two type of criteria in which two things are important, First is measure moisture contained in soil and second isfertility of soil. For the development of the plant environmental parameters such as soil moisture , temperature , humidity ,solar radiation etc. plays a very important role. Moisture loss and temperature management of the plant is due to the humidity .

In India manual type of irrigation system used is the automatic system for irrigation .It is simple and easy to install . The farmers will get proper quantity of Water, by automating farm at the proper time. IoT (Internet of thing) plays a big role in transforming the agriculture industry and enable to farmer to play the challenges they face like increasing water storage limited availability of land. In future using the sensors like temperature, humidity, etc the control of irrigation automation will be possible. Increasing consumption needs of globe population which is expected to growth by 70 % by 2050.Automating farm permits the farmer to use current quantity of water . Using Wi-fi, Ethernet, etc this device could be connected to internet.

Unfortunately , many farmers still used traditional method which results to low yield of crops but when automation has been implemented and human beings has been replaced by them. The yield is improved .

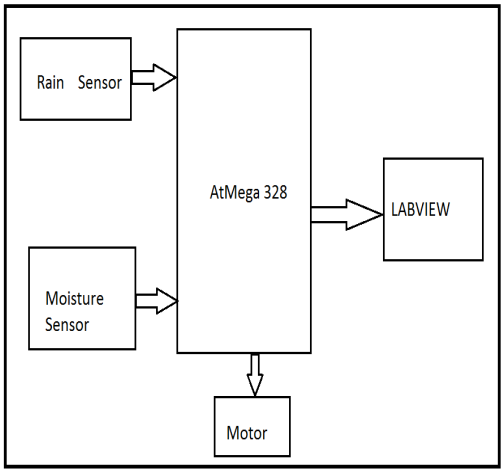
restrictions of physical cables. Additionally, your of Automatic Irrigation Needs:

- It is simple and easy to install.
- It is saving energy and resources, by utilizing in proper way.
- Using automating farm by farmers the actual amount of water would provided at the right time.
- Human errors will be avoided by adjusting the soil moisture level and it is a time saving.

Area of utility:

Focus is to reduces farmers work and to help them. In terminal plant irrigation land for farming ways this model can be used.

Working:



The above shown is the block diagram of the labVIEW module. soil sensor and rain sensor are used. The soil moisture sensor will read the moisture level of the soil and rain sensor will detect the rainfall. Both the data will be sent to the Arduino by sensors. Arduino is connected with the Wi-Fi module ESP8266, which will allow the wireless connection of arduino with the labVIEW software which is present on laptop. LabVIEW will then read the data received

from Arduino by wireless medium .LabVIEW will compare the soil moisture level and rainfall sensing data with a certain predefine threshold. If both the data are below the threshold limit, automatically it will start irrigation by switching ON the relay which will turn on the LED . LABVIEW will also send the data to the Web Server which allow access to the data over internet . In LABVIEW GUI there will be also an option to control the relay manually . This complete process will be repeated continuously once the desired soil moisture level is achieved.

Algorithm:

Step 1 : Start the process .
Step 2 : Initialize power is supplied to Arduino and other peripherals modules.
Step 3 : Check the moisture level (less than or more than) and also for the rain sensor.
Step 4: If the level will be more than a fixed threshold , no need to irrigation ,the relay will be off . Also if it's raining ,the relay will be off .
Step 5:If moisture level is less than a fixed threshold value and no rain , automatically it starts irrigation through relay.
Step 6: Displaying data on LABVIEW interface and Web Server . GUI can also control the relay manually.
Step 7: After the process is completed, it moves to original state and returns to the step3.
Step 8: Stop the process.

point. Adhoc wireless network can be especially applied in enterprise business compounds or military campuses.

Hardware components:

- **Aurduino** : Arduino is a hardware components is a open source of physical components where the simple input and output board and development which is being implemented the processing language. There are 20 pins in the square (0-19) in which the 6 pins are analog inputs and these pins are used as general purpose pins ,an influence jack and a push, a ceramic resonator of frequency 16MHz , an USB associated.
- **Rain sensor:** Rain sensor is module which is used for detecting rain. The module features rain module, control board and separated wire. On the port the LED is provided to indicate the power and a potentiometer can be used to achieve sensitivity.
- **Moisture Sensor** : Usually this module or sensor is used to find the level of moisture of soil and it is sensitive to the very close level of moisture. A YL-69 sensors allows to get two outputs comes with 'a middle –man' circuit as follow, 1.Between the sensors probes an analog readout of the resistance and 2. The digital outputwhich is depending on the humidity whether it is below or above the threshold. Further it can be adjusted by a built in POTS.
- **ESP8266** : The ESP8266 module is a solution that can carry software application or uninstall all Wi-Fi networking capabilitiesthrough another application processor. It isa self-contained Wi-Fi network.
- **LabVIEW** : LabVIEW stands for Laboratory Virtual Instrument Engineering Workbench which is also known as artificial language from national instrument.It is also a system style platform and development surrounding.

IoT:

In the existing infrastructure, IoT is interconnection of the embedded computing device with the help of electronic sensor of internet. IoT connects devices and vehicals. To collect different kinds of data and exchange it, IoT ones physical objects device, vehicles, building and different softwares. The IoT also sense and control the network world wide.

To integrate opportunites for physical world to computer based system. Can be result in greater accuracy and also gave benefits to economic
Wearable and embedded are two kinds of IoT technology. For custom wearable devices developers create app such as peeble Samsung gear or also lead their open platform with help of embedded solution and they build apps for that platform.

Influence of crop types on irrigation system:

Water requirement of crops:

Sr.no	Crops	Duration in days	Water requirements (mm)
1.	Rice	135	1250
2.	Groundnut	105	550
3.	Sorghum	100	350
4.	Maize	110	500
5.	Sugarcane	365	2000
6.	Cotton	165	550
7.	Pulses	65	350

Advantages :

1. This is done with wireless moisture sensors that communicate with the smart irrigation controls and helps inform the system whether or not the landscape is in need of water.
2. The smart irrigation system will help you have better control of your landscape needs as well as peace of mind that the smart system can make decision independently if you are away .
3. You have significant amount if money your water bills because through intelligent control and automation .

4. Your smart irrigation system will optimize resource so that everything gets what it needs without need less waste .
5. With the smart irrigation system we can be better set words of our resource which is a better for environment.

CONCLUSION

The project is developed using in labVIEW and embedded hardware to monitor and control the soil moisture level which also include rain sensor to avoid power wastage. This project is useful for farmers as a smart irrigation tool which will help them to grow crops with minimal use of water. Soil moisture level required for various crops are different for vital plant growth, so this project will effectively utilize and reduce the wastage of water. Also the project allows the user to access the soil moisture levels remotely using a web page which results in better productivity.

REFERENCE

[1] "Smart field system using LabVIEW and Iot" Nisha kushwaha, N.S Beniwal, IJARCCE ISO 3297:2007.
[2] "Remote sensing and control of an irrigation system using distributed wireless sensor network" Yunseop (James) Kim, Member, IEEE, Robert G. Evans, and William M. lversen ,IEEE TRASACTION ON INSTRUMENTATION AND MEASUREMENT ,Vol 57 Number 7,July 2008.
[3] "Internet of thing based Smart Irrigation" Mrs,R.Hemalatha ,G.Deepika ,D.Dhanalakshmi, K.Dharanipriya ,M.Divya.IJARBEST,Vol. 2 ,Issue 2,February 2016.
[4] "IoT based Smart Agriculture" Nikesh Gondchawar ,Prof. Dr. R.S. Kawitkar,IJARCCE,Vol. 5,issue 6 ,June 2016.
[5] "Smart Irrigation System Using Arduino" S.G.Manoj Guru , P.Naveen, R.Vinodh Raja ,V.Srirenga Nachiyar ,SSRG ICRTECITA ,Issue March 2017.

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