

Android Based Intelligent Irrigation System with Crop Selection

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Abstract : Irrigation in India to a maximum extent is dependent on the monsoons, which is also the primary source of water. The type of soil is instrumental in deciding in what way plants are to be provided with water through a proper irrigation system. This project is about the prototype design of microcontroller based intelligent irrigation system controller which will allow irrigation to take place from remote places where manual inspection is not needed. A list of best suited crop is selected from all crops based on the pH value of soil. Values of different monitoring parameters like temperature, humidity, moisture and pH are shown on mobile app. Value of monitoring parameters are altered according to optimal condition required for particular crop.

IndexTerms - Intelligent Irrigation System, Microcontroller, Moisture Sensors, Mobile app, Wi-Fi.

I. INTRODUCTION

In our nation, horticulture is a noteworthy wellspring of nourishment creation to the elaborating interest of the human populace. In farming, water system is a basic procedure that impacts crop generation by providing water to the required land. Ranchers have to visit their property to check how much measure of water is required for their field. This water system technique takes a lot of time and exertion especially when a rancher needs to flood numerous agribusiness fields dispersed in various geological regions. Customarily ranchers will exhibit in their farms to carry out the water system process. Be that as it may, these days ranchers need to carry out their agrarian actions along with other occupations. Robotization in water irrigation system framework enables to make rancher work a lot less demanding. Sensor-based computerized water system framework gives a promising answer for ranchers where the nearness of rancher in the field isn't necessary. Presently multi day's web is generally utilized. Utilizing web rancher thinks about the farming field water system present condition. Based on this, portable applications will be useful in satisfying this reason. It encourages ranchers to know the status of homestead field dampness and temperature through a resourceful application and it will make the rancher at some remote spots to choose whether he needs to water the field or not. The dirt dampness sensor is utilized for detecting dampness level to see if the dirt is dry or wet. The dampness and temperature sensors are interfaced with PIC microcontroller. In light of that sensor esteems, the controller will actuate the DC engine or siphon by sending the directions from the cell phone that will work the siphon through the hand-off. Water is an exceptionally valuable asset and must be legitimately used. Agribusiness is one of the territories which devour a ton of water. The objective of the paper is to build up a canny water system framework controller which estimates the dampness of the dirt and temperature of the air and takes choice as needs be to kills on or the water supply framework. It is critical to know the measure of water that has been utilized in the water system process amid agribusiness. This paper depicts a basic framework by utilizing PIC microcontroller and Android programming to robotize the current manual water system framework.

The Internet of things (IoT) is the network of physical devices vehicles home appliances and other items embedded with electronics, software, sensors, actuators and network connectivity which enable these objects to connect and exchange data. The IoT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. Smart farming is a concept quickly catching on in the agricultural business. Offering high-precision crop control, useful data collection, and automated farming techniques, there are clearly many advantages a networked farm has to offer.

The aim of the paper is to develop an intelligent irrigation system controller which measures the moisture of the soil and temperature of the atmosphere and helps to take decision accordingly to turns on or off the water supply system.

Now a day there is need of farm automation due to lack of resources like man power, water, etc. The system has a distributed wireless network of soil-moisture and temperature, humidity and pH sensors. Automation allows us to control various appliances automatically.

II. LITERATURE SURVEY

The outcomes from paper [1] states that The controller demonstrates the quantity of hours it should work and various occasions it should water the field and the length between each cycle, subsequent to choosing these parameters the status of the engine is to be chosen. IoT based savvy cultivating framework can end up being amazingly helpful for agriculturists since over and furthermore less water framework isn't valuable for developing. Edge regards for climatic conditions like stickiness, temperature, soginess can be settled in light of the biological conditions of that particular region. This structure makes water framework plan

in light of the identified steady data from field and data from the atmosphere store. This structure can recommend agriculturist whether, is there a necessity for water framework [2].

The including features of this endeavour joins sharp GPS based remote controlled robot to perform endeavours like weeding, showering, sogginess distinguishing, feathered animal and animal unnerving, keeping carefulness, etc. Additionally it fuses splendid water framework with sharp control and shrewd fundamental administration in perspective on exact continuous field data. Thirdly, it is a splendid dissemination focus organization which joins temperature support, stickiness upkeep and theft area in the stockroom. Controlling of all of these errands will be through any remote splendid device or PC related with Internet and the exercises will be performed by interfacing sensors, Wi-Fi or ZigBee modules, camera and actuators with littler scale controller and raspberry pi [3].

This task has tried to show a gainful clever property system. It has joined motorization into various pieces of the residence. Another arrangement for animal isolate regions is progressed to upgrade the living conditions of tamed creatures, and furthermore decline physical work. It fuses a mechanized light, temperature, wetness and sprinkler system. The sogginess and moistness control parts guarantee the animals are pleasing in the fenced in territories they are kept in, by modifying the settings as indicated by essential. This will achieve settlement, essentialness viability, and quality and prosperity benefits [4]. For future enhancements it very well may be updated by structure up this system for immensely large pieces of land. Furthermore the structure can be composed to survey the idea of the earth and the advancement of collect in soil. The sensors and microcontroller are viably interfaced and remote correspondence is cultivated between various centres. All discernments and test tests exhibit that this endeavour is a whole response for field activities and water framework issues. Use of such a structure in the field can improve the yield of the harvests and general age [5]. The system incorporates a custom sensor plan for control efficiency, cost amplexness, disgraceful sections, and furthermore versatility end accommodation. In future, a couple of assignments should be done and it would develop the system to a more create state. The system may be furthermore connected for outside utilization [6].

'Web of Things' is far and wide castoff in relating devices and get-together experiences. This cultivation watching structure fills in as a strong and compelling system and therapeutic move can be made. The made system is progressively powerful and worthwhile for agriculturists. It gives the information about the temperature, stickiness of the air in country field through MMS to the farmer, if it fallout from perfect range. The use of such structure in the field can impel the gather of the harvests and overall creation [7].

The automated water framework system has been delineated and executed in this paper. The structure made is important and works in monetarily wise way. It decreases the water usage to a progressively unmistakable degree. It needs immaterial upkeep. The power usage has been reduced specifically. The system can be used as a piece of green houses. The System is amazingly useful in regions where water lack is an imperative issue. The alter proficiency increases and the wastage of harvests is especially diminished using this water framework system. The made structure is increasingly helpful and gives progressively functional results [8].

The paper [9] discussed the improvement of a structure that could address these issues. It in like manner discussed the arrangement necessities and the technique on the most feasible approach to association the framework with immediately available gadgets. The splendid water framework controller was seemed to have the limit of remote association of programming. This limit will give a supportive strategy to make updates to the structure without bothering the end customer. Programming has been made and exchanged to the controller for manual use. The resulting stage will be further developing the item's helpfulness and start tackling data storing likewise, examination for automation purposes. With the improvement of advancement, agrarian field grabbed noteworthiness in restricting the human power. In that way IoT and Image dealing with advancement has been used to perceive the plant infections. The overall water framework circumstance is masterminded by extended enthusiasm for higher plant gainfulness, poor execution and reduced availability of water for agribusiness. In any case, our arrangement will construct the execution of plant field and will keep the field from ailments [10].

III. PROPOSED SYSTEM

Fig. 1 shows the block diagram of the proposed system. It consists of sensing unit such as soil moisture sensor, temperature sensor to measure water content of soil and the atmosphere temperature respectively and a Wi-Fi module in the transmission and receiving process for sending data from sensors to mobile phone and receiving commands from mobile phone.

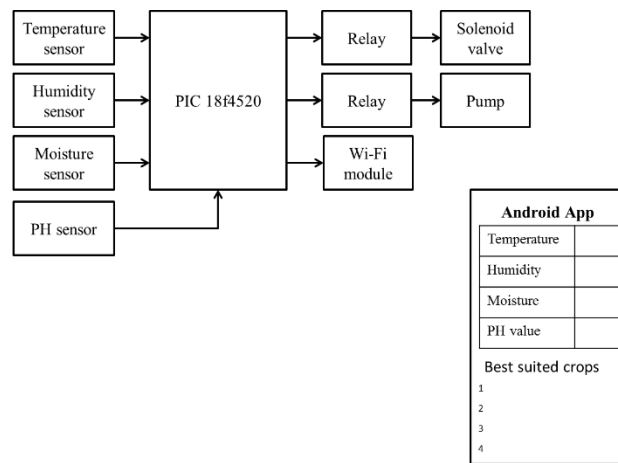


Fig 1: Block Diagram

According to pH value of soil, a list of best suited crop is selected from all crops. Values of different monitoring parameters like temperature, humidity, moisture and pH are shown on mobile app. Value of monitoring parameters are adjusted according to optimal condition required for particular crop. All the data is stored on database. Whenever value of moisture goes below threshold value then pump automatically sets ON.

IV. RESULT AND DISCUSSION

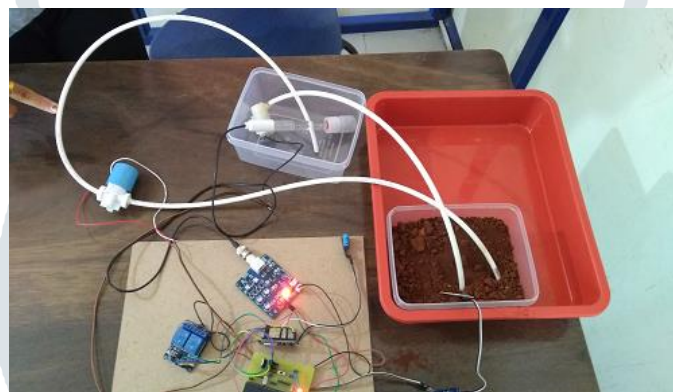


Fig. 2: Hardware

Sensors are interfaced with embedded hardware to monitor and analyzed the farming parameters.

Designed an Android APP for local user to monitor the irrigation activities.

Operated the water motor for any user using the Android APP.

Controlled irrigation method based on farming parameters displayed on IoT server.

V. CONCLUSION

This paper provides an attractive user interface with the most efficient way of controlling the irrigation system. It gives the idea to monitor the soil moisture content and temperature in a farming area and the user can control watering system using Android device provided with Wi-Fi facility. So, the overall implementation cost is cheap and it is affordable for a common person. Considering the present situation, we have chosen Android platform so that most of the people can get benefits. The design consists of Android App by which user can interact and send a control signal to the output of the valve which will control sensors and also monitor the environment. This system of irrigation is also helpful in the region where there is a scarcity of water and improves their sustainability. It is also adjusted according to the need of varieties of the crop to be irrigated. This work can be further extended to develop an advanced real-time irrigation monitoring system through Fuzzy and Neural network techniques.

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