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“A REVIEW ON AUTOMATED IRRIGATION SYSTEM”

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ABSTRACT

Due to high population the requirements of individual are expanding step by step. At the same time the food material prerequisites are likewise expanding. So as to satisfy the food needs, it is fundamental to improve the proficiency of harvest creation in the situations of labor and water shortage. The need of hour is to make an effective usage of accessible labor, water and composts which can prompt cost streamlining of the yearly yield creation. Luckily the various innovations and procedures accessible today can assist with accomplishing the objective of cost streamlining and quality control. This primer work centers around the practical programmed keen water system framework which permits sparing water and human endeavors with wanted amount and nature of yield creation. The proposed framework additionally fuses a basic yet lightweight advanced mobile phone application which can allow the rancher to execute the water system and preparation plans. The test arrangement in the homestead admeasuring 1 section of land of sugarcane crop demonstrated that the water necessity diminished by 56%, labor costs for water system decreased by 90% while power utilization is additionally diminished by 75 % to that of conventional techniques. The proposed framework subsequently prompts a success win circumstance for ranchers just as government battling for water and force gracefully in our nation.

Key Words: Soil moisture water sensor, arduino, GSM module, relay.

I. INTRODUCTION

India is the country of village and agriculture plays an important role for development of country. In our country, agriculture depends on the monsoons which has insufficient source of water. So the irrigation is used in agricultural field In Irrigation system, depending upon the soil type, water is provided to plant. In agriculture, two things are very important, first to get information of about the fertility of soil and second to measure humidity content in air. Nowadays, for irrigation, different techniques are available which are used to reduce the dependency of rain. And mostly this technique is driven by electrical power and on/off scheduling. In this technique, a temperature and humidity sensors are placed near the plant and near the module and gateway unit handles the sensor information and transmit data to the controller which in turns the control the flow of water through the pump.



Figure 1.1 Automated System

1.1 Irrigation Control System Function

User Interface: User interface allow the user to inter act with the system by sending information to the controller by presenting information to user about the system. It's generally a computer or a smartphone controlled.

Devices: Controlled devices include a wide range of equipment that this arduino and sensor is capable of. Here in our project it is a motor.

Programming Computer: Some system controllers allow the user to program the system with the systems own user interface. Other system require PC to program. Here we are accessing arduino IDE with the help of a PC.

Controllers: Relay controllers provide the intelligent control functions in automatic irrigation control.

Sensing Devices: Sensing devices can report values, such as temperature and humidity etc. or states.

Interface Devices: These devices provide the logical communication link between the controllers and the controlled device systems.

II. LITERATURE REVIEW

Karan Kansara, et. al [2015] In Sensor based Automated Irrigation System with IOT mentioned about using sensor based irrigation in which the irrigation will take place whenever there is a change in temperature and humidity of the surroundings. The flow of water is managed by solenoid valve. The opening and closing of valve is done when a signal is send through microcontroller. The water to the root of plant is done drop by drop using rain gun and when the moisture level again become normal then sensor senses it and send a signal to microcontroller and the value is then closed. The two mobile are connected using GSM. The GSM and microcontroller are connected using MAX232. When moisture of the soil become low moisture sensor sense it and send signal to microcontroller, then the microcontroller gives the signal to mobile and it activate the buzzer. This buzzer indicates that valve needs to be opened by pressing the button in the called function signals are sent back to microcontroller. Microcontroller used can increase System Life and lower the power Consumption. There system is just limited to the automation of irrigation system and lacks in extra ordinary features.[1]

Joaquin Gutierrez et. al [2013] In Automated Irrigation System Using a Wireless Sensor Network and GPRS Module mentioned about using automatic irrigation system in which irrigation will take place by wireless sensor units (WSUs) and a wireless information unit (WIU), linked by radio transceivers that allowed the transfer of soil moisture and temperature data, implementing a WSN that uses ZigBee technology. It takes a measure of temperature and moisture using sensor and controlled by microcontroller. The WIU has also a GPRS module to transmit the data to a web server via the public mobile network. The information can be remotely monitored online through a graphical application through Internet access devices. This irrigation system allows cultivation in places with water scarcity thereby

improving sustainability and it is feasible system. But due to Zigbee protocol this system becomes more costly.[2]

VandanaDubey et. al [2013] In Wireless Sensor Network based Remote Irrigation Control System and Automation using DTMF code mentioned about using automated irrigation system for proper yield and handled remotely for farmer safety. Wireless sensor network and Embedded based technique of DTMF (Dual Tone Multiple Frequency) signaling to control water flow for sectored, sprinkler or drip section irrigation. Circuit switching instead of packet switching used by SMS controlled devices available currently in the market. The farmer can use his cell phone or landline phone for the purpose of starting and controlling the irrigation and the pesticide spraying, just by dialing and sending the DTMF commands over the GSM network. This system will be very economical in terms of the hardware cost, power consumption and call charges. Farmers have to control (on/off) the valves time to time (even at night) which increases the running cost because every time we have to make a call to on or off the valves and it is also very inconvenient. Farmers are unable to know the status of power supply at the field.[3]

G.Nisha et. al [2014] In Wireless Sensor Network Based Automated Irrigation and Crop Field Monitoring System mentioned about using wireless sensor network based automated irrigation system for optimize water use for agricultural purpose. The system consists of distributed wireless sensor network of soil moisture, and temperature sensors placed in the crop field. To handle the sensor information Zig bee protocol used and control the water quantity programming using an algorithm with threshold values of the sensors to a microcontroller for irrigation system. The system continuously displays the abnormal condition of the land (soil moisture, temperature level). Using a GSM modem with GPRS facility feature provides the information to fanners and interface with PIC 18F77 A microcontroller. The Irrigation system is automatic and manual mode. This system increase the crop fields, improve the crop quality, increase the energy and reduce the non-point source pollution. Due to PIC microcontroller the length of the program will be big because of using RISC (35 instructions).[4]

Kavianand G et. al [2016] In Smart drip irrigation system for sustainable agriculture mentioned about using fully automated drip irrigation system which is controlled and monitored by using ARM9 processor. PH content and the nitrogen content of the soil are frequently monitored. For the purpose of monitoring and controlling, GSM module is implemented. The system is used to turn the valves ON or OFF automatically as per the water requirement of the plants. The system informs user about any abnormal conditions like less moisture content and temperature rise, even concentration of CO₂ via SMS through the GSM module. The moisture sensor output will help to determine whether to irrigate the land or not depending upon the moisture content. Along with moisture sensor the temperature sensor output can also be taken into consideration while irrigating the land. If the moisture content of soil is very low and the temperature is very high then there is need of irrigation for plants, but the time for which irrigation will be provided is different for different temperature range. Small amount of water is lost through deep percolation if the proper amount is applied. ARM processor is that it is not binary compatible with x86. This means you not going to be running windows any time soon. There are several Unixoperating systems that can run on ARM however, such as Linux and BSD.[5]

III. METHODOLOGY

The system method includes the implementation of proto-type device work robotically and controlled thru the mobile application. For the prototype format drawing up the timeline and reading related works will be step one. After looking into benefits and downsides of previous studies in the subject of an automatic irrigation system, we can start implementing the layout and automation method for executable. The timeline of the project became set on the flowchart of the project. The steps can will be in the following process chart:

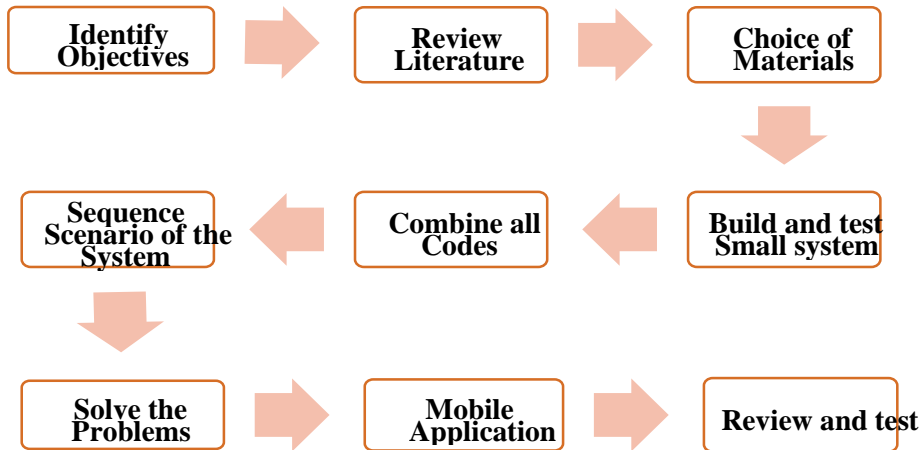


Figure 3.1: Process Flowchart

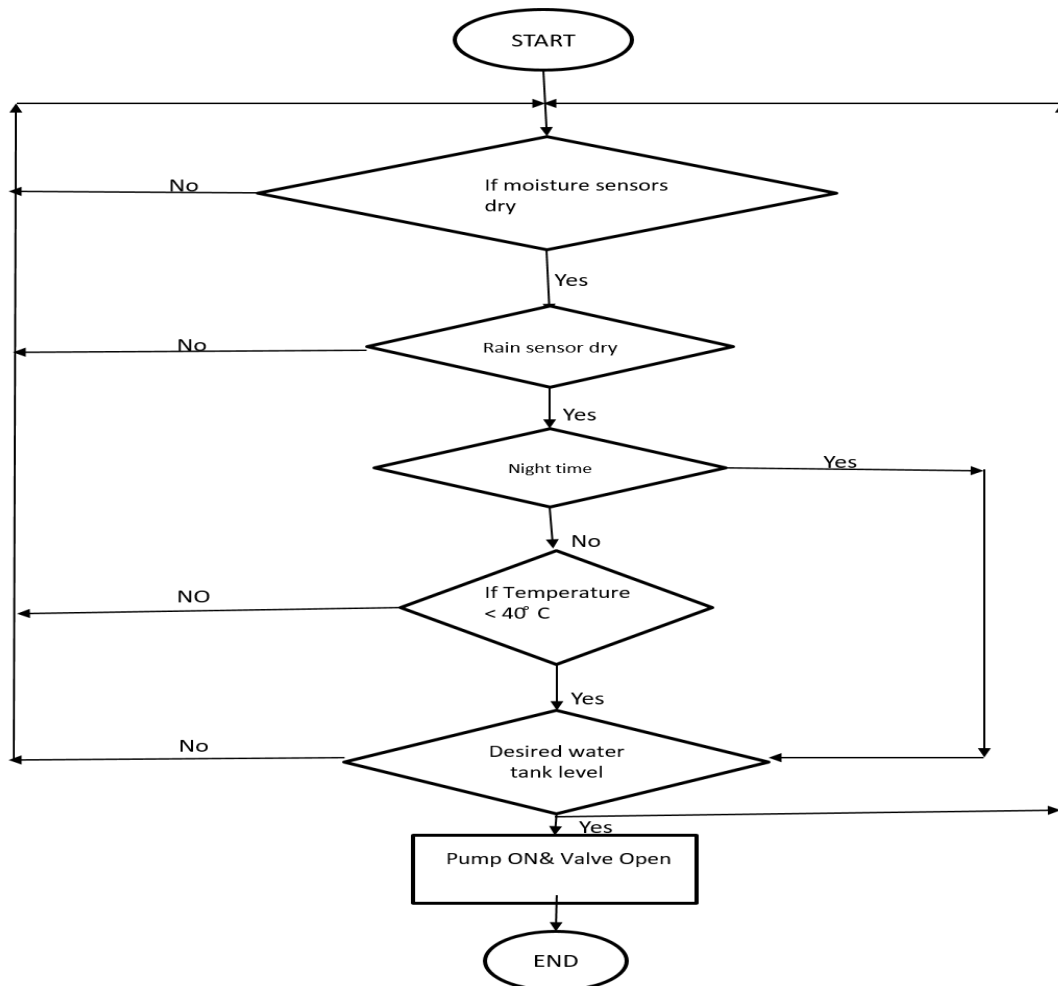


Figure 3.2: Process Flowchart

IV. CONCLUSION

The automatic irrigation control using arguing Uno has been experimentally proven to work satisfactorily and we could successfully set the timer and managed to control the motor over time. This process not only records values of temperature and humidity it also controls the motor accordingly. Analysing the weather condition motor will automatically maintain water supply making it possible to maintain greenery without human intervention.

V. FUTURE WORK

Using this system as framework, the system can be expanded to include various other options which could include mobile application control of motor and wi-fi controlled monitoring. These will expand the working capability and efficiency of this prototype. It can be implemented not in agriculture but in gardens in any places using the sprinkler concept. It has a vast scope when it is mixed with IOT. Automation will get a new dimension through this.

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